What is claimed is:

1   1.   A communication system having first communication means, second

2   communication means and a first transmission path as well as at least one further transmission

3   path between said first and said second communication means, in which at least the first

4   communication means are provided with transmission means for each of said transmission paths,

5   which are capable of sending at least part of a communication signal to the second communication

6   means, in which at least the second communication means comprise reception means for each of

7   said transmission paths, which are capable of receiving at least part of said communication signal,

8   wherein the first communication means comprises:

9   a training generator that generates a training code to be sent to the reception

10 means enabling the reception means to match a received signal to a corresponding transmitted

11 signal, wherein the training generator is capable of generating a training code with at least nearly

12 ideal cyclic auto-correlation properties such that its cyclic auto-correlation function is at least

13 nearly zero for all cyclic shifts, in that the transmission means are capable of concurrently sending

14 said training code in a mutually shifted manner and in that the reception means are capable of

15 performing a cyclic auto-correlation with respect to a received training signal.

1   2.   Communication system according to claim 1, wherein the reception means

2   are capable of generating the cyclic shifts of a received training code and to correlate these with

3   said training code.

1   3.   Communication system according to claim 1, wherein the training code

2   comprises a concatenation of the rows of a Fourier matrix.

1   4.   Communication system according to claim 3, wherein the training code has

2   a length which is equal to the number of transmission paths or an integer multiple thereof.

1   5.   Communication system according to claim 1, wherein the training code y is

2   derived from a maximal length sequence x with an uneven length L, having an auto-correlation of

3   −1 for all cyclic shifts, such that at least approximately

4    $y = x + j/oL$.

1   6.   Communication system according to claim 1, wherein the training codes are

2   preceded and followed by a dummy code during operation.

        7.   Communication system according to claim 1, wherein the training

2   generator comprises a pre-correction filter for processing the training codes.

1   8.   Communication system according to claim 1, wherein the training

2   generator comprises storage means for storage one or more training codes.

1   9.   Communication system according to claim 1, wherein the training

2   generator during operation, issue a number of at least substantially identical training codes and in

3   that the receiving means comprise summation means to average the received training codes.

1   10.   Communication system according to claim 1, wherein the training

2   generator at least during operation, issue at least substantial training codes at a substantially fixed

3   interval and in that the reception means are provided with auto-correlation means for correlating a

4   received signal with one or more signals received after a delay corresponding to said interval or an

5   integer multiple thereof.